A Human Skeletal Muscle Atlas Identifies the Trajectories of Stem and Progenitor Cells across Development and from Human Pluripotent Stem Cells.

Journal:	Cell Stem Cell
Publication Year:	2020
Authors:	Haibin Xi, Justin Langerman, Shan Sabri, Peggie Chien, Courtney S Young, Shahab Younesi, Michael Hicks, Karen Gonzalez, Wakana Fujiwara, Julia Marzi, Simone Liebscher, Melissa Spencer, Ben Van Handel, Denis Evseenko, Katja Schenke-Layland, Kathrin Plath, April D Pyle
PubMed link:	32396864
Funding Grants:	Identification and Generation of Long Term Repopulating Human Muscle Stem Cells from Human Pluripotent Stem Cells

Public Summary:

Development of a human atlas of skeletal muscle development and from human pluripotent stem cells.

Scientific Abstract:

The developmental trajectory of human skeletal myogenesis and the transition between progenitor and stem cell states are unclear. We used single-cell RNA sequencing to profile human skeletal muscle tissues from embryonic, fetal, and postnatal stages. In silico, we identified myogenic as well as other cell types and constructed a "roadmap" of human skeletal muscle ontogeny across development. In a similar fashion, we also profiled the heterogeneous cell cultures generated from multiple human pluripotent stem cell (hPSC) myogenic differentiation protocols and mapped hPSC-derived myogenic progenitors to an embryonic-to-fetal transition period. We found differentially enriched biological processes and discovered co-regulated gene networks and transcription factors present at distinct myogenic stages. This work serves as a resource for advancing our knowledge of human myogenesis. It also provides a tool for a better understanding of hPSC-derived myogenic progenitors for translational applications in skeletal muscle-based regenerative medicine.

Source URL: https://www.cirm.ca.gov/about-cirm/publications/human-skeletal-muscle-atlas-identifies-trajectories-stem-and-progenitor